

**IN THE UNITED STATES DISTRICT COURT  
FOR THE WESTERN DISTRICT OF VIRGINIA  
BIG STONE GAP DIVISION**

SOUTHERN APPALACHIAN MOUNTAIN  
STEWARDS, APPALACHIAN VOICES,  
and SIERRA CLUB,

Plaintiffs,

v.

CIVIL ACTION NO. \_\_\_\_\_

RED RIVER COAL COMPANY, INC.,

Defendant.

**FIRST AMENDED COMPLAINT FOR DECLARATORY AND INJUNCTIVE RELIEF**

**INTRODUCTION**

1. This is a citizen suit for declaratory and injunctive relief against Defendant Red River Coal Company, Inc., (“Red River”) for violations of the Federal Water Pollution Control Act, 33 U.S.C. § 1251 et seq. (hereafter the “Clean Water Act” or “CWA”), and the Surface Mining Control and Reclamation Act, 30 U.S.C. § 1201 et seq. (hereafter “SMCRA”), and the Resource Conservation and Recovery Act, 42 U.S.C. § 6901 et seq. (hereafter “RCRA”) at its North Fox Gap Surface Mine in Wise County, Virginia.

2. As detailed below, Plaintiffs allege that Red River has discharged and continues to discharge pollutants into waters of the United States without authorization for those discharges in violation of Section 301 of the CWA, 33 U.S.C. § 1311.

3. Plaintiffs further allege that Red River’s discharges of pollutants into waters adjacent to the North Fox Gap Surface Mine violate the performance standards under SMCRA and the terms and conditions of its Virginia Coal Surface Mining Operation Permit 1101401.

4. Lastly, Plaintiffs allege that Red River's disposal of solid waste from the North Fox Gap Surface Mine may present an imminent and substantial endangerment to the environment in violation of 7002(a)(1)(B) of RCRA (42 U.S.C. § 6972).

### **JURISDICTION AND VENUE**

5. This Court has jurisdiction over this action pursuant to 28 U.S.C. § 1331 (federal question), 33 U.S.C. § 1365 (CWA citizen's suit provision), 42 U.S.C. § 6972 (RCRA citizen's suit provision), and 30 U.S.C. § 1270 (SMCRA citizen's suit provision).

6. On June 2, 2017, Plaintiffs gave notice of the violations and their intent to file suit to the Defendant, the United States Environmental Protection Agency ("EPA"), the Office of Surface Mining Reclamation and Enforcement ("OSMRE"), the Virginia Department of Mines, Minerals and Energy ("DMME"), and the Virginia Department of Environmental Quality ("DEQ"), as required by Section 505(b)(1)(A) of the CWA, 33 U.S.C. § 1365(b)(1)(A), and Section 520(b)(1)(A) of SMCRA, 30 U.S.C. § 1270(b)(1)(A).

7. More than sixty days have passed since the notice was sent. No civil or criminal action to redress the violations has been initiated by EPA, OSMRE, DMME, or DEQ. Moreover, neither EPA nor the Commonwealth of Virginia has commenced an administrative penalty action under Section 309(g) of the CWA, 33 U.S.C. § 1319(g), or a comparable state law to redress the violations prior to the issuance of the June 2, 2017, notice letter.

8. On June 30, 2017, Red River responded to the Groups' notice letter by initiating a lawsuit against the Groups in this Court under the Declaratory Judgment Act. Civil Action No. 2:17-cv-21, Doc. 1. Red River's lawsuit does nothing more than assert legal defenses to the

allegations in the Groups' notice letter that would be better adjudicated as part of the present action. On July 26, 2017, the Groups filed a motion to dismiss Red River's lawsuit with prejudice for lack of jurisdiction and failure to state a claim. *Id.*, Docs. 13 and 14.

9. On July 21, 2017, Plaintiffs sent a second notice of violations and their intent to file suit. This second letter put Defendant on notice that its discharges constituted violations of RCRA by disposing of waste which may present an imminent and substantial endangerment to the environment. This letter was also sent to EPA, DMME, and the U.S. Attorney General, in compliance with 42 U.S.C. § 6972(b)(2)(A).

10. More than ninety days have passed since the second notice was sent. In that time EPA has not undertaken any measures to restrain or abate acts or conditions which may have contributed or are contributing to the activities which may present endangerment that would prevent this action. Specifically, 1) EPA has not commenced or prosecuted an action under RCRA or the Comprehensive Environmental Response, Compensation and Liability Act of 1980 ("CERCLA"); 2) EPA is not engaging in a removal action under section 104 of CERCLA; 3) EPA has not incurred costs to initiate a Remedial Investigation and Feasibility Study under section 104 of CERCLA, and consequently is not diligently proceeding with any such action; and, 4) EPA has not obtained a court order or consent decree or issued an administrative order under section 106 of CERCLA.

11. In the ninety days since the notice was sent the Commonwealth of Virginia has not undertaken any measures to restrain or abate acts or conditions which may have contributed or are contributing to the activities which may present endangerment that would prevent this action. Specifically, 1) Virginia has not commenced or diligently prosecuted an action under RCRA; 2) Virginia has not engaged in a removal action under section 104 of CERCLA; and, 3)

Virginia has not incurred costs to initiate a Remedial Investigation and Feasibility Study under section 104 of CERCLA.

12. Venue in this District is proper pursuant to 33 U.S.C. § 1365(c)(1) because the sources of the CWA violations are located in this District, and pursuant to 30 U.S.C. § 1270(c) because the coal mining operations complained of are located in this District.

13. Likewise, venue in this district is appropriate pursuant to 42 U.S.C. § 6972(a) because this is the district in which the endangerment has occurred.

### **PARTIES**

14. Red River is a Virginia corporation engaged in the business of mining coal.

15. Red River is a person within the meaning of Section 502(5) of the CWA, 33 U.S.C. § 1362(5), Section 701(19) of SMCRA, 30 U.S.C. § 1291(19), and Section 1004(15) of RCRA, 42 U.S.C. § 6903(15).

16. At all relevant times, Red River has owned and operated the North Fox Gap Surface Mine in Wise County, Virginia. The mine is regulated pursuant to Virginia Coal Surface Mining Operation (“CSMO”) Permit 1101401. The mine discharges pollutants into the South Fork Pound River, Rat Creek, Stillhouse Branch, and unnamed tributaries to those water bodies. Some of those discharges are authorized by, and subject to the effluent limits in, Virginia Pollutant Discharge Elimination System (“VA/NPDES”) permit VA0081401. Additional discharges from the mine are not currently authorized by any VA/NPDES permit.

17. Plaintiff Southern Appalachian Mountain Stewards (“SAMS”) is a non-profit membership organization incorporated under the laws of the Commonwealth of Virginia. SAMS is a Virginia corporation and has approximately thirty active members. SAMS works with community members, partner groups and government authorities to prevent and correct harmful

economic, environmental and human health effects of coal extraction in southwest Virginia, and to promote sustainable economic development in the region. SAMS monitors and participates in the public aspects of Clean Water Act and SMCRA regulatory decisions. SAMS' concerns include the exploration, enjoyment, restoration and protection of surface waters in Southwest Virginia. SAMS monitors water quality in the South Fork Pound River watershed.

18. Plaintiff Appalachian Voices is a nonprofit North Carolina corporation committed to protecting the land, air, and water of the central and southern Appalachian region, focusing on reducing coal's impact on the region. Appalachian Voices has more than 1,000 members, the majority of which reside in the Appalachian region, including North Carolina, Virginia and Tennessee, and it maintains a permanent office in Virginia. Its concerns include the protection and restoration of surface waters in Virginia.

19. Plaintiff Sierra Club is a nonprofit corporation incorporated in California, with approximately 800,000 members nationwide, including approximately 20,000 members who reside in Virginia and belong to its Virginia Chapter. The Sierra Club is dedicated to exploring, enjoying, and protecting the wild places of the Earth; to practicing and promoting the responsible use of the Earth's resources and ecosystems; to educating and enlisting humanity to protect and restore the quality of the natural and human environment; and to using all lawful means to carry out those objectives. The Sierra Club's concerns encompass the exploration, enjoyment and protection of surface waters in Virginia.

20. Plaintiffs have members – including, but not limited to, Ms. Jessica Bier – who use, enjoy, and benefit from the water quality in the South Fork Pound River and its tributaries. They would like to recreate in and otherwise use and enjoy areas downstream from the portions of the streams into which Red River's North Fox Gap Surface Mine discharges pollutants

harmful to aquatic life, including the ions that contribute to total dissolved solids and conductivity. Excessive amounts of these pollutants degrade the water quality of the South Fork Pound River and its tributaries, make the water aesthetically unpleasant and environmentally undesirable and impair its suitability for aquatic life. Because of this pollution, Plaintiffs' members refrain from using or restrict their usage of the South Fork Pound River, its tributaries, and associated natural resources. Plaintiffs' members and employees also expend their time and resources collecting water samples and otherwise monitoring the water quality and ecological health of the South Fork Pound River downstream of the North Fox Gap Surface Mine. As a result, the environmental, economic, health, aesthetic, and recreational interests of these members are adversely affected by Red River's excessive discharges of these and other pollutants into the South Fork Pound River and its tributaries from Red River's North Fox Gap Surface Mine in violation of the Clean Water Act, SMCRA, RCRA, and associated permits. If Red River's discharges ceased, the harm to the interests of Plaintiffs' members would be redressed. An injunction would redress Plaintiffs' members' injuries by preventing future violations of the Clean Water Act, SMCRA, and the limits in Red River's permits.

21. At all relevant times, Plaintiffs were and are "persons" as that term is defined by the CWA, 33 U.S.C. § 1362(5), SMCRA, 30 U.S.C. § 1291(19), and RCRA, 42 U.S.C. § 6903(15).

## **STATUTORY AND REGULATORY FRAMEWORK**

### **A. Clean Water Act**

22. Section 301(a) of the CWA, 33 U.S.C. § 1311(a), prohibits the "discharge of any pollutant by any person" into waters of the United States except in compliance with the terms of

a permit, such as a National Pollutant Discharge Elimination System (“NPDES”) permit issued by EPA or an authorized state pursuant to Section 402 of the CWA, 33 U.S.C. § 1342.

23. Section 402(a) of the CWA, 33 U.S.C. § 1342(a), provides that the permit-issuing authority may issue a NPDES permit that authorizes the discharge of any pollutant directly into waters of the United States, upon the condition that such discharge will meet all applicable requirements of the CWA and such other conditions as the permitting authority determines necessary to carry out the provisions of the CWA.

24. At all times relevant to this complaint, the Commonwealth of Virginia has been authorized by EPA to administer a NPDES program for regulating the discharges of pollutants into the waters of Virginia. Permits issued under this program are known as “VA/NPDES” permits.

25. Section 303(a) of the CWA, 33 U.S.C. § 1313(a), requires that states adopt ambient water quality standards and establish water quality criteria for particular water bodies that will protect designated uses of the water.

26. Among Virginia’s water quality standards is 9 VAC 25-260-20, which provides that “State waters, including wetlands, shall be free from substances attributable to sewage, industrial waste, or other waste in concentrations, amounts, or combinations which contravene established standards or interfere directly or indirectly with designated uses of such water or which are inimical or harmful to human, plant, or aquatic life.”

27. Section 505(a) of the CWA, 33 U.S.C. § 1365(a), authorizes any “citizen” to “commence a civil action on his own behalf . . . against any person . . . who is alleged to be in violation of . . . an effluent standard or limitation under this chapter.”

28. Section 505(f) of the CWA, 33 U.S.C. § 1365(f), defines an “effluent standard or limitation under this chapter,” for purposes of the citizen suit provision in Section 505(a) of the CWA, 33 U.S.C. § 1365(a), to mean, among other things, an unlawful act under Section 301(a) of the CWA, 33 U.S.C. § 1311(a), and “a permit or condition thereof issued” under Section 402 of the CWA, 33 U.S.C. § 1342.

29. In an action brought under Section 505(a) of the CWA, 33 U.S.C. § 1365(a), the district court has jurisdiction to order the defendant to comply with the CWA.

30. Under section 505(d) of the CWA, 33 U.S.C. § 1365(d), the court “may award costs of litigation (including reasonable attorney and expert witness fees) to any prevailing or substantially prevailing party, whenever the court determines such an award is appropriate.”

#### **B. Surface Mining Control and Reclamation Act**

31. Section 506 of SMCRA, 30 U.S.C. § 1256, prohibits any person from engaging in or carrying out surface coal mining operations without first obtaining a permit from OSMRE or from an approved state regulatory authority.

32. At all relevant times, the Commonwealth of Virginia has administered an approved surface mining regulatory program under SMCRA. *See* 30 C.F.R. § 946.10.

33. Among the performance standards mandated by SMCRA and the Virginia Coal Surface Mining Control and Reclamation Act (“VCSMCRA”) is that “[d]ischarge from areas disturbed by . . . mining shall not violate effluent limitations or cause a violation of applicable water quality standards.” 30 C.F.R. §§ 816.42 and 817.42; 4 VAC 25-130-816.42.

34. The performance standards further require that “[a]ll surface mining and reclamation activities shall be conducted . . . to prevent material damage to the hydrologic



balance outside the permit area.” 4 VAC 25-130-816.41. At a minimum, “material damage” includes violations of water quality standards.

35. The VCSMCRA regulations provide that “[t]he permittee shall comply with the terms and conditions of the permit, all applicable performance standards of the Act, and the requirements of this chapter.” 4 VAC 25-130-773.17(c).

36. Section 520(a) of SMCRA, 30 U.S.C. § 1270(a), authorizes any person adversely affected to bring an action in federal court to compel compliance with SMCRA against any “person who is alleged to be in violation of any rule, regulation, order or permit issued pursuant to [SMCRA].”

37. Section 520(d) of SMCRA, 30 U.S.C. § 1270(d), authorizes the Court to award the costs of litigation, including attorneys fees and expert witness fees, “to any party, whenever the court determines such an award is appropriate.”

38. DMME’s Division of Mined Land Reclamation (“DMLR”) is the agency in the Commonwealth of Virginia that administers the state’s SMCRA program and its CWA program as applied to coal mines and that issues VA/NPDES Permits and VCSMCRA Permits.

### **C. RESOURCE CONSERVATION AND RECOVERY ACT**

39. RCRA, 42 U.S.C. § 6901 et seq., governs the treatment, storage, and disposal of solid and hazardous waste.

40. The primary purpose of RCRA is to reduce the generation of hazardous waste and to ensure the proper treatment, storage, and disposal of waste that is nonetheless generated so as to minimize the present and future threat to human health and the environment. 42 U.S.C. § 6902(b).

41. Consistent with its purpose, RCRA provides private citizens with a cause of action against any person, including any past or present generator, past or present transporter, or past or present owner or operator of a treatment, storage, or disposal facility, who has contributed or who is contributing to the past or present handling, storage, treatment, transportation, or disposal of any solid or hazardous waste which may present an imminent and substantial endangerment to health or the environment. 42 U.S.C. § 6972(a)(1)(B).

42. RCRA defines solid waste to include solid, liquid, and semisolid materials resulting from mining operations—except for industrial discharges which are point sources subject to permits under the CWA. 42 U.S.C. § 6903(27).

43. In a RCRA citizen suit, the Court has jurisdiction to restrain the person who has contributed or is contributing to the disposal of hazardous waste that may present an imminent and substantial endangerment and to order such person to take such other action as may be necessary.

44. Pursuant to 42 U.S.C. § 6972(e), the Court may award the costs of litigation (including reasonable attorney and expert witness fees) to the prevailing or substantially prevailing party whenever the court determines such an award is appropriate.

### **FACTS**

45. Red River's mining activities at the North Fox Gap Surface Mine are regulated under Virginia SMCRA/CSMO Permit 1101401.

46. The Clean Water Act discharge permit associated with the North Fox Gap Surface Mine is VA/NPDES Permit VA0081401.

47. Virginia originally issued both the SMCRA/CSMO Permit 1101401 and VA/NPDES Permit VA0081401 on January 16, 1992, and those permits have remained in effect from that time forward.

48. As part of its permitted mining operation at the North Fox Gap Surface Mine, Red River deposited mine spoil into eight hollow fills, numbered 1 through 8. Each of the eight hollow fills includes an engineered underdrain to channelize and direct the flow of water through the fill and out through the toe of the fill. All eight hollow fills, including underdrains, remain in place where they were originally constructed.

49. As constructed, and prior to approximately June 2014, Fill 1 and its associated Underdrain 1 discharged into Pond 1, which then itself discharged through Outfall 001 into an unnamed tributary of the South Fork Pound River.

50. As constructed, and prior to approximately June 2014, Fill 2 and its associated Underdrain 2, together with Fill 3 and its associated Underdrain 3, discharged into Pond 2, which then discharged through Outfall 002 into a separate unnamed tributary of the South Fork Pound River.

51. As constructed, and prior to approximately June 2014, Fill 4 and its associated Underdrain 4, together with Fill 5 and its associated Underdrain 5, discharged into Pond 5, which then discharged through Outfall 003 into another unnamed tributary of the South Fork Pound River.

52. As constructed, and prior to approximately June 2014, Fill 6 and its associated Underdrain 6 discharged into Pond 9, which then discharged through Outfall 006 into an unnamed tributary of Rat Creek which, in turn, flows into the South Fork Pound River at a point downstream from the other discharges.

53. During a site inspection on April 29, 2014, DMLR authorized Red River to remove Pond 3 (below Underdrain 2) and Pond 4 (below Underdrain 3).

54. During a site inspection on June 11, 2014, DMLR authorized Red River to remove Pond 1 (below Underdrain 1), Pond 2 (below Underdrains 2 and 3), Pond 5 (below Underdrains 4 and 5), Pond 6 (below Underdrains 4 and 5), and Pond 9 (below Underdrain 6).

55. From at least June 2014, or whenever Red River completed final pond removal, Underdrains 1, 2, 3, 4, 5, and 6 all discharged directly into their respective receiving streams without passing through a sediment pond or other treatment system.

56. In a "Monitoring Point Detail Supplement" dated February 26, 2015, DMLR authorized the deletion of Outfall 003 (below Underdrains 4 and 5) from Red River's VA/NPDES Permit VA0081401. In the same "Monitoring Point Detail Supplement," DMLR authorized the relocation of the VA/NPDES monitoring locations for Outfall 001 (below Underdrain 1), Outfall 002 (below Underdrains 2 and 3), and Outfall 006 (below Underdrain 6), from their prior locations below the fills to new locations upslope of the fills at mine bench Ponds 1B, 3B, and 7B, respectively. Red River has not reported any discharges from mine bench Ponds 1B, 3B, or 7B.

57. Red River has not reported VA/NPDES monitoring data from Ponds 1, 2, 3, 4, 5, 6, and 9, or from the original locations of Outfalls 001, 002, 003, or 006, since ponds were removed and outfalls deleted or relocated.

58. As a result of the release of SMCRA/CSMO Permit 1201338 in March 2007, and the monitoring point modifications approved in the "Monitoring Point Detail Supplement," as of at least February 26, 2015, Red River no longer possesses any VA/NPDES permit authorizing

the discharge of any pollutant in any amount from Underdrains 1, 2, 3, 4, 5, or 6 or otherwise from the locations of hollow Fills 1, 2, 3, 4, 5, or 6.

59. Underdrains 1, 2, 3, 4, 5, and 6 continue to produce discharges high in total dissolved solids and with high conductivity.

60. The discharges from Underdrains 1, 2, 3, 4, 5, and 6 have resulted in elevated levels of total dissolved solids and conductivity in their respective receiving streams, including Rat Creek, the South Fork Pound River, Stillhouse Branch, and unnamed tributaries to those water bodies.

61. Prior to the commencement of mining operations at the North Fox Gap Surface Mine, water quality in the receiving streams was good. Red River stated in 1991, as part of the “probable Hydrologic Consequences” section of its VCSMCRA permit application, that “[d]ischarges from the permit area flow to South Fork Pound River and Rat Creek. Baseline data show that existing stream water quality in these two streams is generally good.”

62. Since mining operations began, water quality in the receiving streams has diminished considerably, and the streams are now impaired. Baseline monitoring conducted in January 1992, prior to the commencement of mining at the North Fox Gap Surface Mine, at monitoring point R-2 in the South Fork Pound River downstream from all discharges from the mine, showed the level of total dissolved solids (“TDS”) to be 626 mg/l. Monitoring conducted on May 12, 2017, at approximately the same location in the South Fork Pound River, showed the level of TDS to be 1720 mg/l, almost three times the baseline level.

63. The level of TDS below the underdrains has similarly increased significantly from prior to mining to today. The following table compares the TDS levels at monitoring points below Underdrains 1, 2, 3, 4, 5, and 6, as measured by Red River in January 1992 and by the

U.S. Office of Surface Mining Reclamation and Enforcement in August 2016, two years after the ponds were removed.<sup>1</sup>

<b>Table 1 - Comparison of current TDS (mg/l) discharges to pre-mining baseline</b>		
<b>Location</b>	<b>1992 – baseline</b>	<b>2016</b>
Fill 1/ UD-1	1018	2460
Fill 2/ UD-2	1339	2100
Fill 3/ UD-3	1546	2100
Fill 4/ UD-4	798	2820
Fill 5/ UD-5	776	2820
Fill 6/ UD-6	420	2250

64. The level of conductivity measured in the South Fork Pound River is also significantly elevated and continues to increase. Monitoring conducted by Red River's contractor, Biologic Monitoring, Inc., at monitoring point SFP-2, located just downstream from monitoring point R-2 and downstream from all discharges from the North Fox Gap Surface Mine, shows steadily increasing levels of conductivity from 2012, before the ponds were removed, to today. The following table summarizes those conductivity monitoring results.

<b>Table 2 – Conductivity levels measured at SFP-2</b>	
<b>Date</b>	<b>Conductivity (µS/cm)</b>
11/5/2012	1942
5/13/2013	1984
9/5/2013	2060
4/28/2014	2110
9/29/2014	2160
10/17/2016	2230

65. Monitoring conducted by Red River at each of the underdrains pursuant to its SMCRA/CSMO permit confirms that the underdrains and related hollow fills are a significant source of the high levels of total dissolved solids and conductivity measured in the receiving

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<sup>1</sup> All monitoring data provided in this complaint that pre-dates April 14, 2015, is offered for the sole purpose of demonstrating historic conditions and long-term trends.

streams, including the South Fork Pound River, below the mine. The following table presents the range of results reported for TDS, conductivity, and flow at each of the underdrains between January 2012 and February 2017. The complete set of monitoring data for TDS, conductivity, and flow for each of the underdrains is presented in Appendix A to this Complaint.

<b>Table 3 – Range of TDS, conductivity and flow levels reported at Underdrains 1, 2, 3, 4, 5, and 6 from January 2012 through February 2017</b>			
UD	TDS (mg/l)	Conductivity ( $\mu$ S/cm)	Flow (gpm)
UD-1	1018-3356	701-3115	0-100
UD-2	1990-4148	1640-3952	5-300
UD-3	1568-3372	1662-3254	30-520
UD-4	952-2330	441-2832	0-920
UD-5	1986-3256	1544-3304	10-162
UD-6	1698-2488	820-2699	15-400

66. Red River has itself acknowledged that its surface mining activities at the North Fox Gap Surface mine are the cause of the elevated levels of TDS and conductivity in the discharges from its underdrains and, ultimately, in the several unnamed tributary receiving streams and in Rat Fork, Stillhouse Branch, and the South Fork Pound River. Red River stated, in the “Probable Hydrologic Consequences Determination” document it prepared as part of its 2016 application 1007840 related to SMCRA/CSMO permit 1101401, that “[u]nderdrains UD-1, 2, 3, 4, and 6 continue to show elevated levels for parameters TDS, conductivity and sulfates,” and that “[c]onductivity, total dissolved solids, and sulfate values have fluctuated, but on average appear to have increased somewhat from baseline results.”

67. Biological monitoring in the South Fork Pound River and Rat Creek makes clear that the high-TDS and high-conductivity discharges from Red River’s North Fox Gap Surface Mine have caused or contributed to harm to aquatic life in those streams. On October 17, 2016, Red River’s contractor, Biologic Monitoring, Inc., calculated the Virginia Stream Condition

Index (“VASCI”) score at monitoring point SFP-2 in the South Fork Pound River, downstream from all discharges from the North Fox Gap Surface Mine. Biologic Monitoring reported a VASCI score of 33.6, which is indicative of “severe stress.” Any VASCI score below 60 is considered to indicate biological impairment. The following table provides the results of biological monitoring conducted at SFP-2 from fall 2012 through fall 2016, all of which indicate biological impairment.

<b>Table 4 – Biological monitoring at SFP-2</b>	
<b>Date</b>	<b>VASCI</b>
11/5/2012	43.2 (stress)
5/13/2013	35.5 (severe stress)
9/5/2013	31.8 (severe stress)
4/28/2014	39 (severe stress)
9/29/2014	35.2 (severe stress)
10/17/2016	33.6 (severe stress)

68. The Virginia Department of Environmental Quality designates the South Fork Pound River and its tributaries as impaired for aquatic life on its CWA section 303(d) list based on macroinvertebrate bioassessments.

69. In 2011, EPA scientists summarized the existing science connecting conductivity pollution from surface coal mines and biological degradation in an EPA report entitled, “A Field-Based Aquatic Life Benchmark for Conductivity in Central Appalachian Streams.” That report, which was peer-reviewed by top scientists on EPA’s Science Advisory Board, used EPA’s standard method for deriving water quality criteria to derive a conductivity benchmark of 300  $\mu\text{S}/\text{cm}$ . *Id.* at xiv-xv. According to the species sensitivity distribution in the benchmark, on average, five percent of species are lost when conductivity rises to 295  $\mu\text{S}/\text{cm}$ , over 50% are lost at 2000  $\mu\text{S}/\text{cm}$ , and close to 60% are lost at 3000  $\mu\text{S}/\text{cm}$ . *Id.* at 18. EPA considered potential confounding factors, including habitat, temperature, deposited sediments and pH, and concluded



that none of them altered the relationship between conductivity and biological decline or the benchmark value of 300  $\mu\text{S}/\text{cm}$ . Id. at 41, B-22. EPA found that the loss of aquatic species from increased conductivity was “a severe and clear effect.” Id. at A-37. EPA also conducted a detailed causal assessment and concluded that there is a causal relationship between conductivity and stream impairment at the streams it studied in West Virginia. Id. at A-39. Finally, EPA’s benchmark report analyzed the relationship between conductivity levels and the biological impairment threshold employed by the West Virginia Stream Condition Index (“WVSCI”), a measure of biological integrity very similar to the VASCI. EPA found that a WVSCI score of 64 (close to the impairment threshold of 68) corresponds to streams with conductivity of about 300  $\mu\text{S}/\text{cm}$  on average. Id. at A-36. A statistical analysis included in the benchmark determined that at a conductivity level of 300  $\mu\text{S}/\text{cm}$  a stream is 59% likely to be impaired, and at 500  $\mu\text{S}/\text{cm}$  a stream is 72% likely to be impaired. Id.

70. The EPA benchmark is supported by multiple more recent peer-reviewed studies. Cormier, et al., “Derivation of a Benchmark for Freshwater Ionic Strength,” Environmental Toxicology and Chemistry, 32(2): 263-271 (2013), and references cited therein; Bernhardt, et al., “How Many Mountains Can We Mine? Assessing the Regional Degradation of Central Appalachian Rivers by Surface Coal Mining,” Environmental Science & Technology, 46 (15), pp. 8115–8122 (2012).

71. The ionic mixture coming out of the underdrains at Red River’s North Fox Gap Surface Mine listed above is consistent with that associated with coal mining pollution in this region. Pond, et al., “Downstream effects of mountaintop coal mining: comparing biological conditions using family- and genus-level macroinvertebrate bioassessment tools.” J. North Am. Bentholological Soc., 27(3), 717–737 (2008); Palmer et al., “Mountaintop mining consequences.”

Science 327, 148-149 (2010); Bernhardt and Palmer, “The environmental costs of mountaintop mining valley fill operations for aquatic ecosystems of the Central Appalachians.” Year Ecol. Conserv. Biol., 1223, 39-57 (2011); Lindberg et al., “Cumulative impacts of mountaintop mining on an Appalachian watershed.” PNAS 108:52 (2011); Pond, “Patterns of Ephemeroptera taxa loss in Appalachian 3 headwater streams (Kentucky, USA),” Hydrobiologia, 641: 185–201 (2010); Pond, “Biodiversity loss in Appalachian headwater streams: Plecoptera and Trichoptera communities,” Hydrobiologia, 679: 97-117 (2012); Pond et al., “Long-term Impacts on Macroinvertebrates Downstream of Reclaimed Mountaintop Mining Valley Fills in Central Appalachia,” Env. Mgmt., 54(4): 919-33 (2014); Kunz, et al., “Use of Reconstituted Waters to Evaluate Effects of Elevated Major Ions Associated with Mountaintop Coal Mining on Freshwater Invertebrates,” Environmental Toxicology and Chemistry, 32(12): 2826-35 (2013). The ionic mixture of calcium, magnesium, sulfate, and bicarbonate in alkaline mine water discharged from coal mines causes the loss of aquatic macroinvertebrates in Appalachian areas where surface coal mining is prevalent; it is the mixture of ions that causes the biological impairment. Cormier et al., “Assessing causation of the extirpation of stream macroinvertebrates.” Environmental Science and Technology, 32(2): 277-287 (2013b); Cormier and Suter (2013). This mixture also has significant adverse effects on fish assemblages (Hitt et al., “Temporal changes in taxonomic and functional diversity of fish assemblages downstream from mountaintop mining.” Freshwater Science, 33(3) (2014); Hopkins et al., “Effects of mountaintop mining on fish distributions in central Appalachia.” Ecology of Freshwater Fish, 22:578–586 (2013)) and has toxic effects on aquatic life, including mayflies (Kunz, “Use of Reconstituted Waters to Evaluate Effects of Elevated Major Ions Associated with Mountaintop Coal Mining on Freshwater Invertebrates.” Environmental Toxicology and Chemistry, 32:12, pp.

2826-35 (2013); Echols, et al., “Preliminary results of lab toxicity tests with the mayfly, *Isonychia bicolor* for development as a standard test organism for evaluating streams in the Appalachian coalfields of Virginia and West Virginia.” Env. Monit. Assess. (2010); Kennedy, et al., “Evaluation of ecologically relevant bioassays for a lotic system impacted by a coal-mine effluent, using *Isonychia*.” Env. Monit. Assess. 95:37-55 (2004)).

72. The applicability of EPA’s benchmark to first- and second-order headwater streams within Virginia’s Central Appalachian coalfield region was confirmed by Timpano, et al., “Levels of Dissolved Solids Associated with Aquatic Life Effects in Headwater Streams of Virginia’s Central Appalachian Coalfield Region” (2011), prepared for Virginia Department of Environmental Quality and Virginia Department of Mines, Minerals, and Energy. That study’s authors concluded that:

Family-level biological effects, as defined by VASCI scores indicating stressed or severely stressed conditions, were observed with increasing probability from 0% at TDS  $\leq$  190 mg/L to 100% at TDS  $\geq$  1,108 mg/L.

73. Based on the monitoring conducted below the underdrains and in the receiving streams, and on the findings of the peer-reviewed scientific studies discussed above, the ongoing discharges of calcium, magnesium, sulfate and bicarbonate (measured as TDS and conductivity) discharged from Red River’s North Fox Gap Surface Mine’s Underdrains 1, 2, 3, 4, 5, and 6 are causing or materially contributing to biological impairment in the South Fork Pound River, Rat Creek, Stillhouse Branch, and unnamed tributaries to those water bodies.

**FIRST CLAIM FOR RELIEF  
(CWA Violations)**

74. Plaintiffs incorporate by reference all allegations contained in paragraphs 1 through 73 above.

75. Calcium, magnesium, sulfate and bicarbonate (measured as TDS and conductivity) are “pollutants” as that term is defined in section 502 of the CWA, 33 U.S.C. § 1362(6).

76. The South Fork Pound River, Rat Creek, Stillhouse Branch, and the unnamed tributaries below Underdrains 1, 2, 3, 4, 5, and 6 are all waters of the United States within the meaning of 33 U.S.C. § 1362(7).

77. Each of the Underdrains 1, 2, 3, 4, 5, and 6 is a discernible, confined and discrete conveyance that discharges to surface waters and is therefore a “point source” within the meaning of 33 U.S.C. § 1362(14).

78. Red River’s VA/NPDES permit VA0081401 does not authorize the discharge of any pollutants from Underdrains 1, 2, 3, 4, 5, or 6.

79. Red River’s ongoing discharges of pollutants from point sources at the North Fox Gap Surface Mine into waters of the United States without permit authorization violate Section 301 of the Clean Water Act, which prohibits the discharge of any pollutant by any person, except in compliance with a permit. 33 U.S.C. § 1311.

80. Section 505(f)(1) defines “an effluent standard or limitation” to include “an unlawful act under subsection (a) of Section 301 of this title.” 33 U.S.C. § 1365(f)(1). Section 301(a), in turn, prohibits “the discharge of any pollutant by any person” except in compliance with the Act’s requirements. 33 U.S.C. § 1311(a). By discharging the pollutants calcium, magnesium, sulfate and bicarbonate (measured as TDS and conductivity) without authorization from a permit under the CWA, Red River is in ongoing violation of section 301(a).

81. Each and every discharge of the pollutants calcium, magnesium, sulfate and bicarbonate (measured as TDS and conductivity) by Red River from the North Fox Gap Surface

Mine occurring after April 14, 2015, is actionable under section 505(a)(1) of the Clean Water Act. 33 U.S.C. § 1365(a)(1).

82. Red River's own monitoring establishes that it has discharged, and continues to discharge, calcium, magnesium, sulfate and bicarbonate (measured as TDS and conductivity) into Rat Creek, Stillhouse Branch, the South Fork Pound River, and unnamed tributaries of those water bodies, after April 14, 2015, as described above.

83. On information and belief, Red River has taken no meaningful action to address its ongoing unpermitted discharges.

84. Unless enjoined, Red River will remain in continuing violation of the Clean Water Act.

#### **SECOND CLAIM FOR RELIEF (SMCRA Violations)**

85. Plaintiffs incorporate by reference all allegations contained in paragraphs 1 through 73 above.

86. Red River's SMCRA/ CSMO Permit 1101401 requires it to comply with performance standards of the VCSMCRA. VA Code § 45.1-242(B); 4 VAC 25-130-773.17(c).

87. Those performance standards provide that "[d]ischarges of water from areas disturbed by surface mining activities shall be made in compliance with all applicable State and Federal water quality laws, standards and regulations and with the effluent limitations for coal mining promulgated by the U.S. Environmental Protection Agency set forth in 40 CFR 434." 4 VAC 25-130-816.42; 30 C.F.R. §§ 816.42 and 817.42.

88. Virginia's water quality standards provide that "State waters . . . shall be free from substances attributable to sewage, industrial waste, or other waste in concentrations, amounts, or combinations which contravene established standards or interfere directly or

indirectly with designated uses of such water or which are inimical or harmful to human, animal, plant, or aquatic life.” 9 VAC 25-260-20.

89. VCSMCRA performance standards also provide that “[a]ll surface mining and reclamation activities shall be conducted to . . . prevent material damage to the hydrologic balance outside the permit area.” 4 VAC 25-130-816.41(a). “Material damage,” at a minimum, includes violations of water quality standards.

90. By violating the Virginia water quality standard for aquatic life protection at its North Fox Gap Surface Mine, after April 14, 2015, Red River has also violated, and is continuing to violate, the performance standards incorporated as conditions in its SMCRA/CSMO Permit 1101401.

91. VCSMCRA performance standards further require that “[i]f drainage control, restabilization and revegetation of disturbed areas, diversion of runoff, mulching, or other reclamation and remedial practices are not adequate to meet the requirements of this section and 4VAC25-130-816.42, the permittee shall use and maintain the necessary water treatment facilities or water quality controls.” 4 VAC 25-130-816.41(d)(1); *see also* 30 C.F.R. § 816.41(d)(1).

92. The violations identified herein show that Red River’s existing treatment methods are insufficient to meet the requirement imposed by 4 VAC 25-130-816.41(d)(1). Thus, the performance standards incorporated into Red River’s SMCRA/CSMO Permit 1101401 require Red River to construct a system that will effectively treat its effluent to levels that comply with all applicable water quality standards.

93. Each violation of Red River's SMCRA/ CSMO permit after April 14, 2015, is a violation of SMCRA and is enforceable under the citizen suit provision of SMCRA, 30 U.S.C. § 1270(a).

94. Unless enjoined, Red River's violations of SMCRA will continue.

**THIRD AND ALTERNATIVE CLAIM FOR RELIEF  
(RCRA Violations)**

95. Plaintiffs hereby incorporate by reference all allegations in paragraphs 1 through 73 above.

96. As described previously, Red River's ongoing discharges from underdrains 1, 2, 3, 4, 5 and 6 at the North Fox Gap Surface Mine have caused or contributed to violations of the narrative water quality standards for the protection of aquatic life.

97. Red River's discharges contain pollutants such as sulfate, calcium, magnesium and bicarbonates measured as TDS and conductivity that are harmful to aquatic organisms in the South Fork Pound River, Rat Creek and unnamed tributaries of those waters.

98. If Red River's discharges are deemed not to come from point sources subject to section 402 of the CWA, then Red River is disposing of solid waste within the meaning of RCRA. 42 U.S.C. § 6903(27) (solid wastes include "discarded material, including . . . liquid . . . material resulting from . . . mining operations," but not "industrial discharges which are point sources" subject to CWA § 402 permits.").

99. As a result of its discharges at its mine site, Red River is a person who is contributing to the past or present disposal of a solid waste.

100. As shown by the violations of water quality standards in the South Fork of the Pound, Rat Creek, and unnamed tributaries of those streams, the wastes disposed or by Red River may present an imminent and substantial endangerment to the environment.

**RELIEF REQUESTED**

WHEREFORE, Plaintiffs respectfully request that this Court enter an Order:

101. Declaring that Red River has violated and is in continuing violation of the CWA or, alternatively, RCRA, and SMCRA;

102. Enjoining Red River from operating its North Fox Gap Surface Mine in such a manner as will result in further violations of the CWA, SMCRA, SMCRA/CSMO Permit 1101401, or RCRA;

103. Ordering Red River to immediately secure CWA permit authorization for its discharges from Underdrains 1, 2, 3, 4, 5, and 6, and to comply with all effluent limitations, monitoring and reporting requirements, and other terms and conditions of such permit authorization;

104. Alternatively, ordering Red River to immediately cease disposing of wastes which may present an imminent and substantial endangerment to the environment;

105. Ordering Red River to immediately comply with the terms and conditions of SMCRA/CSMO Permit 1101401;

106. Ordering Red River to conduct monitoring and sampling to determine the environmental effects of its violations, to remedy and repair environmental contamination and/or degradation caused by its violations, and to restore the environment to its prior uncontaminated condition;

107. Awarding Plaintiffs their attorney and expert witness fees and all other reasonable expenses incurred in pursuit of this action; and

108. Granting other such relief as the Court deems just and proper.



Respectfully submitted,

/s/ Evan D. Johns

Evan D. Johns (VA Bar No. 89285)  
Appalachian Mountain Advocates  
415 Seventh Street Northeast  
Charlottesville, Virginia 22902  
(434) 529-6787  
ejohns@appalmad.org

Peter M. Morgan (application for admission *pro hac*  
*vice* pending)  
1536 Wynkoop St., Ste 312  
Denver, CO 80202  
(303) 454-3367  
peter.morgan@sierraclub.org

*Counsel for Southern Appalachian Mountain  
Stewards, Appalachian Voices, and Sierra Club*

**APPENDIX A****Sampling results for TDS and conductivity for Underdrains 1, 2, 3, 4, 5, and 6****Underdrain 1**

Date	UD-1: TDS	UD-1: Cond.	UD-1: Flow
1/12/12	2038	2189	3
1/27/12		1667	15
2/2/12		1882	15
2/21/12		1677	10
3/1/12		1075	100
3/9/12		1043	50
4/2/12	2524	2573	25
4/19/12		2041	5
5/4/12		2012	5
5/15/12		1898	10
6/1/12		2222	25
7/2/12	3356	3099	2
7/9/12		2433	1
8/1/12		1095	45
8/10/12		1793	3
10/8/12	2144	2275	10
11/1/12		1405	15
12/11/12		2200	5
12/21/12		2221	10
1/14/13	1520	1793	20
1/31/13		701	25
2/14/13		1664	5
2/22/13		1934	10
3/12/13		1448	10
3/25/13		933	10
4/5/13	1398	1729	100
4/12/13		1719	10
5/8/13		2030	60
5/20/13		1568	35
6/7/13		2591	25
6/21/13		1590	75

7/11/13	1586	1906	5
7/29/13		2159	3
8/12/13		2188	3
10/22/13	2402	2733	1
11/1/13		2382	3
11/18/13		2454	1
12/10/13		947	6
12/17/13		1404	5
1/13/14	1018	1343	40
1/24/14		2141	15
2/17/14		1796	15
2/25/14		1542	20
3/16/14		1852	30
3/26/14		2367	25
4/16/14	1844	2040	5
4/24/14		2025	4
5/8/14		2044	3
5/29/14		2590	3
6/12/14		2615	5
6/21/14		2568	10
7/10/14	3092	3054	3
7/22/14		2986	5
8/19/14		3034	7
8/28/14		3115	8
9/10/14		3110	5
9/24/14		2536	2
10/14/14	1892	2098	5
10/22/14		2171	3
11/11/14		1980	2
11/20/14		2043	5

12/11/14		2047	1
12/24/14		2026	1
1/12/15	1458	1627	1
1/22/15		1983	1
2/11/15		1656	5
3/16/15		1515	40
3/26/15		2305	5
4/9/15	1474	1760	5
4/21/15		1558	5
5/11/15		2391	5
7/10/15	1992	2207	2
7/21/15		1601	5
8/13/15		2701	2
8/27/15		2907	2
9/4/15		2950	1
9/25/15		1653	5
10/15/15	2298	2559	5
10/28/15		2665	3
11/9/15		2594	5
11/25/15		2843	5
12/7/15		1812	5
12/16/15		2302	3
3/5/16	1558	1740	5
6/21/16	2498	2553	3
9/28/15	2740	2828	1
11/30/16	1162	1476	5
2/22/17	1600	1912	5



**Underdrain 2**

	UD- 2: TDS	UD- 2: Cond.	UD- 2: Flow								
1/17/12	2990	3029	20	4/19/13		1640	300	10/10/14	2932	2960	90
1/27/12		2487	5	5/9/13		3186	40	10/24/14		3170	70
2/9/12		2795	15	5//13		2157	50	11/5/14		2982	70
2/28/12		2806	50	6/5/13		3440	40	11/13/14		3054	65
3/9/12		1673	75	6/21/13		1967	100	12/3/14		2978	10
3/19/12		2803	30	7/2/13	2974	3027	50	12/23/14		3069	18
4/3/12	3282	3271	10	7/17/13		3255	50	1/10/15	2770	2895	20
4/25/12		3405	45	8/7/13		3771	35	1/20/15		3019	40
5/4/12		3476	15	8/16/13		3078	10	2/10/15		2818	65
5/15/12		2509	25	9/10/13		3028	25	3/16/15		2424	75
6/15/12		3716	10	9/27/13		3357	15	3/26/15		3065	54
6/28/12		3670	20	10/8/13	3400	3388	20	4/9/15	2748	2773	15
7/2/12	4148	3676	15	10/16/13		3593	10	4/21/15		2667	27
7/30/12		3237	5	11/8/13		3373	30	5/11/15		3481	27
8/6/12		1778	100	11/21/13		3344	30	5/18/15		3518	15
8/30/12		2747	10	12/5/13		3131	10	6/11/15		3826	27
9/4/12		3261	15	12/17/13		2670	25	6/18/15		3775	5
9/14/12		3627	30	1/10/14	2614	2862	34	7/10/15		3232	15
10/11/12	1990	2217	35	1/24/14		3082	25	7/21/15		3205	36
10/23/12		3661	10	2/10/14		2720	34	8/13/15		3921	18
11/8/12		3182	75	2/19/14		1746	34	8/27/15		4021	25
11/26/12		3184	25	3/6/14		2369	34	9/4/15		4068	18
12/7/12		3316	20	3/13/14		2809	50	9/25/15		4022	10
12/14/12		3011	25	4/3/14	2950	2933	80	10/12/15		3744	25
12/27/12		1651	150	4/29/14		2690	88	10/22/15		3952	18
1/11/13	2716	2737	50	5/7/14		3414	37	11/9/15		3784	5
1/28/13		2644	100	5/29/14		3424	20	11/23/15		3763	27
2/7/13		2217	35	6/2/14		3463	10	12/7/15		3111	27
2/21/13		2629	35	6//14		3612	36	12/16/15		3586	10
3/13/13		2411	25	7/7/14	3922	3645	11	3/5/16		2955	35
3/26/13		2288	100	7/21/14		2031	40	6/21/16		3692	18
4/5/13	2576	2675	75	8/12/14		1687	48	9/27/16		3868	25
				8/19/14		3204	73	11/22/16		3822	18
				9/3/14		3005	65	2/22/17		3174	25
				9/29/14		3400	70				

**Underdrain 3**

Date	UD-3: TDS	UD-3: Cond .	UD-3: Flow
1/17/12	1804	2136	150
1/27/12		2049	30
2/9/12		2048	50
2/28/12		2069	250
3/9/12		1875	400
3/19/12		1987	350
4/3/12	1906	2055	200
4/25/12		2237	200
5/4/12		2202	300
5/15/12		2115	300
6/15/12		2238	300
6/28/12		2220	200
7/2/12	1990	2214	300
7/30/12		2205	300
8/6/12		1910	350
8/30/12		2275	300
9/4/12		2314	400
9/14/12		2179	150
10/11/12	3372	3254	250
10/23/12		2240	250
11/8/12		2116	350
11/26/12		2243	200
12/7/12		2221	300
12/14/12		2183	350
12/27/12		1662	250
1/11/13	1910	2202	350
1/28/13		2127	250
2/7/13		2122	300
2/21/13		2071	250
3/13/13		2092	250
3/26/13		2059	300

4/5/13	1866	2080	300
4/19/13		2074	400
5/9/13		2185	300
5/20/13		1908	30
6/5/13		2327	225
6/21/13		2180	120
7/2/13	2028	2280	350
7/17/13		2324	250
8/7/13		2340	250
8/16/13		2276	250
9/10/13		2291	200
9/27/13		2304	250
10/8/13	2080	2355	200
10/16/13		2338	150
11/8/13		2338	100
11/21/13		2211	100
12/5/13		2210	150
12/17/13		2120	350
1/10/14	1786	2091	520
1/24/14		2080	456
2/10/14		2025	520
2/19/14		1838	520
3/6/14		1941	520
3/13/14		2006	350
4/3/14	1948	2068	400
4/29/14		2103	378
5/7/14		2173	243
5/29/14		2200	250
6/2/14		2195	200
6/20/14		2233	216
7/7/14	2044	2231	100
7/21/14		2037	150
8/12/14		1685	250
8/19/14		2214	328
9/3/14		2238	266

9/29/14		2260	270
10/10/14	1906	2184	300
10/24/14		2233	280
11/5/14		2261	280
11/13/14		2223	250
12/3/14		2196	250
12/23/14		2195	270
1/10/15	1902	2196	300
1/20/15		2210	350
2/10/15		2151	410
3/16/15		2219	400
3/26/15		2192	288
4/9/15	1858	2121	350
4/21/15		2088	288
5/11/15		2141	365
5/18/15		2231	250
6/11/15		2378	162
6/18/15		2335	150
7/10/15	1930	2212	250
7/21/15		2065	315
8/13/15		2325	180
8/27/15		2298	250
9/4/15		2300	180
9/25/15		2300	150
10/12/15	1792	2184	250
10/22/15		2297	180
11/9/15		2200	150
11/23/15		2247	270
12/7/15		2111	270
12/16/15		2202	250
3/5/16	1676	1919	350
6/21/16	1958	2109	216
9/27/16	2020	2224	250
11/30/16	1568	1922	200
2/22/17	1880	2156	300

**Underdrain 4**

Date	UD-4: TDS	UD-4: Cond .	UD-4: Flow
1/19/12	2100	2267	5
1/27/12		1759	5
2/10/12		1913	2
2/28/12		1905	10
3/21/12		2078	2
3/30/12		2221	2
4/20/12	2212	2445	2
4/27/12		1578	5
5/8/12		2342	3
5/25/12		2339	2
6/15/12		2301	1
6/27/12		2522	1
7/16/12	1362	1458	2
7/30/12		2535	2
8/13/12		2526	2
8/30/12		2481	2
9/14/12		2446	2
10/18/12	2266	2377	1
10/29/12		2418	2
11/13/12		2123	2
11/26/12		2117	2
12/17/12		2402	1
12/28/12		2384	13
1/14/13	1660	1918	5
1/28/13		1928	5
2/7/13		1909	5

2/19/13		1889	5
3/4/13		1692	5
3/28/13		1624	25
4/5/13	1682	1818	30
4/19/13		833	100
5/9/13		1977	920
5/21/13		1981	15
6/7/13		2243	15
6/18/13		441	120
7/11/13	2016	2284	5
7/23/13		2310	5
8/8/13		2295	5
8/22/13		2284	5
9/23/13		2302	5
1/10/14	1384	1711	5
1/24/14		1937	5
2/10/14		1607	5
2/19/14		2085	5
3/4/14		1556	15
3/13/14		1681	20
4/3/14	1540	1757	13
4/29/14		1923	18
5/7/14		2070	10
5/21/14		2186	5
6/2/14		2263	3
6/20/14		2337	2
7/7/14	2330	2394	2
7/21/14		2326	5
8/12/14		2200	10
8/19/14		1992	11
9/3/14		2025	10
9/29/14		2832	20
10/10/14	1154	1363	25
10/24/14		1950	10

11/5/14		1763	10
11/13/14		1859	5
12/3/14		1981	5
12/24/14		1910	1
1/10/15	1398	1689	2
1/20/15		1964	10
2/10/15		1708	18
3/16/15		1719	40
3/26/15		2123	27
4/9/15	1462	1712	5
4/21/15		1635	27
5/11/15		2200	5
7/10/15	1304	1531	10
7/21/15		1690	18
8/13/15		2242	3
8/27/15		2374	1
10/12/15	1730	2084	3
10/22/15		2261	3
11/9/15		2014	3
11/23/15		2082	1
12/7/15		1776	5
12/16/15		2107	2
3/5/16	1594	1810	5
5/27/16	1852	1888	3
9/27/16	2042	2240	1
11/30/16	952	1222	10
1/30/17	1502	1450	5

**Underdrain 5**

Date	UD-5: TDS	UD-5: Cond.	UD-5: Flow
1/19/12	2588	2710	10
1/27/12		2428	15
2/10/12		2560	50
2/28/12		2571	30
3/21/12		2621	45
3/30/12		2631	100
4/20/12	2726	2873	60
4/27/12		2229	50
5/8/12		2906	50
5/25/12		2907	20
6/15/12		2873	10
6/27/12		3102	25
7/16/12	2906	2801	20
7/30/12		3130	30
8/13/12		3091	45
8/30/12		2985	35
9/14/12		2956	30
9/28/12		2470	35
10/18/12	3142	3048	30
10/29/12		3085	25
11/13/12		2758	50
11/26/12		2745	50
12/17/12		3081	30
12/28/12		3238	162
1/14/13	2502	2620	125
1/28/13		2909	40
2/7/13		2588	50
2/19/13		2554	50
3/4/13		2269	65
3/28/13		2435	75
4/5/13	2512	2548	150
4/19/13		1927	150

5/9/13		2645	35
5/21/13		2733	30
6/7/13		2883	40
6/18/13		1544	150
7/11/13	1986	2236	50
7/23/13		2300	50
8/8/13		2380	50
8/22/13		2334	50
9/10/13		2469	30
9/23/13		2400	30
10/10/13	2604	2835	30
10/25/13		2914	35
11/18/13		2733	35
11/25/13		2721	35
12/5/13		2721	35
12/13/13		1945	35
1/10/14	2464	2720	68
1/24/14		2708	68
2/10/14		2433	68
2/19/14		2073	68
3/4/14		2417	83
3/13/14		2515	70
4/3/14	2330	2465	60
4/29/14		2646	79
5/7/14		2670	47
5/21/14		2717	45
6/2/14		2868	25
6/20/14		3033	20
7/7/14	3102	3085	43
7/21/14		2307	45
8/12/14		2214	50
8/19/14		2902	65
9/3/14		2883	50
9/29/14		3011	60
10/10/14	2722	2820	65

10/24/14		2832	50
11/5/14		2789	50
11/13/14		2730	45
12/3/14		2739	35
12/24/14		2719	36
1/10/15	2506	2612	40
1/20/15		2734	80
2/10/15		2591	120
3/16/15		2560	100
3/26/15		2804	72
4/9/15	2362	2510	50
4/21/15		2435	54
5/11/15		2794	54
5/18/15		2604	50
6/11/15		3056	36
6/18/15		3127	40
7/10/15	2510	2682	50
7/21/15		2651	41
8/13/15		3028	36
8/27/15		3059	50
9/4/15		3105	27
9/25/15		3042	20
10/12/15	2432	2720	45
10/22/15		2875	36
11/9/15		2825	35
11/23/15		2915	54
12/7/15		2451	36
12/16/15		2715	35
3/5/16	2226	2391	45
5/27/16	2506	2575	54
9/27/16	3198	3194	36
11/22/16	3256	3304	36
1/30/17	2374	2116	50

**Underdrain 6**

Date	UD-6: TDS	UD-6: Cond.	UD-6: Flow
1/12/12	2074	2197	25
1/27/12		1986	25
2/2/12		2135	20
2/21/12		2051	50
3/1/12		1708	50
3/30/12		2219	50
4/19/12	2034	2334	50
4/27/12		1553	50
5/4/12		2236	20
5/29/12		1841	30
6/18/12		2486	30
6/27/12		2626	25
7/9/12	2422	2481	50
7/30/12		2198	30
8/1/12		1638	200
8/13/12		2236	150
9/11/12		2570	50
9/20/12		2557	50
10/2/12	2290	2354	75
10/29/12		2661	35
11/1/12		2328	200
11/30/12		2699	75
12/10/12		2120	300
12/21/12		2598	100
1/14/13	2302	2462	150
1/28/13		2238	75
2/14/13		2170	75
2/22/13		2211	75
3/12/13		2140	75
3/25/13		2134	175
4/5/13	2244	2277	200
4/18/13		2131	400
5/8/13		2315	140
5/20/13		2308	100
6/7/13		2504	60
6/18/13		820	400
7/11/13	2184	2342	75
7/31/13		2452	25
8/14/13		2225	50
8/28/13		2402	50
9/19/13		2405	50
9/26/13		2279	35
10/16/13	2214	2429	35
10/24/13		2424	15

11/1/13		2211	25
11/18/13		2250	35
12/9/13		1730	75
12/19/13		2069	50
1/6/14	1698	2033	75
1/24/14		2131	50
2/3/14		1309	75
2/19/14		1840	100
3/6/14		2031	95
3/19/14		1189	75
4/1/14	1840	1984	80
4/16/14		2166	200
5/2/14		2090	120
5/12/14		2320	125
6/11/14		2289	75
6/26/14		2445	25
7/7/14	2382	2460	50
7/14/14		2430	60
8/12/14		1840	65
8/28/14		2293	75
9/3/14		2296	80
9/29/14		2435	80
10/10/14	2060	2250	90
10/24/14		2406	60
11/5/14		2420	60
11/13/14		2421	55
12/3/14		2380	35
12/23/14		2405	50
1/10/15	2236	2392	55
1/20/15		2393	70
2/10/15		2321	100
3/16/15		2203	150
3/26/15		2307	100
4/9/15	2090	2231	250
4/24/15		2140	150
5/11/15		2269	50
5/18/15		2323	50
6/10/15		2423	50
6/17/15		2447	50
7/9/15	2004	2125	75
7/17/15		1940	100
8/11/15		2183	50
8/24/15		2461	50
9/11/15		2520	40
9/25/15		2576	50
10/12/15	2088	2355	100
10/28/15		2352	50

11/5/15		2451	25
11/23/15		2521	50
3/5/16	1870	2020	100
6/10/16	2194	2390	75
9/28/16	2488	2588	30
11/30/16	1536	1805	100
2/27/17	2120	2301	75





